

Part 2: Physical Requirements

200) Service Conductors

200.10) General

200.10.10) For the purpose of this discussion, service conductors are the electrical supply line(s), overhead or underground, which are installed, owned, and maintained by the Company between its distribution system and the Customer's substation. These conductors are installed, owned, and maintained by the Company even though in some cases the Customer may be required to make a financial contribution toward their cost.

200.10.20) The following paragraphs are intended to provide the Customer with general information relative to the Company's requirements for termination of service conductors and to designate a point at which division of ownership occurs. The Company will provide additional supplementary details as required, especially where underground services are involved.

200.20) Overhead Service Conductors

200.20.10) Overhead service conductors are terminated on a deadend structure provided by the Customer. The Company will provide the following data for each overhead service to a substation to assist the Customer in the design of an appropriate deadend structure.

- a) Approximate heavy loaded tension for each conductor associated with the service.
- b) Required conductor spacing and configuration at point of attachment.
- c) Minimum attachment height necessary to provide adequate clearance for service conductors.

200.20.20) Customer shall provide and install a deadend structure of adequate size and structural strength consistent with data furnished by the Company.

200.20.30) Where such deadend structures are constructed of wood, the Customer need not provide additional termination details. The Company will drill the necessary holes and furnish and install all required attachment hardware.

200.20.40) Where steel deadend structures are employed, the Customer shall furnish and install suitable attachment provisions.

200.30) Underground Service Conductors

The Company will generally provide, install and terminate the incoming service lateral cable(s) when the supply to a Customer substation is underground. The following paragraphs outline specific Company requirements for representative installations:

Part 2: Physical Requirements

200.30.10) Cubicle–Type Substations Consisting of Metal–Clad or Metal–Enclosed Switchgear Supplied Via Single Conductor Direct Burial Service Lateral Cable or Single Conductor Lead Jacketed Cables

The Customer shall furnish and install the following facilities for entry and termination of underground service lateral(s):

a) Terminal pad with NEMA standard two–hole drilling on which service lateral cables are to be terminated. The Company will connect service lateral cables to Customer's terminal pad with a NEMA standard two–hole cable lug. Such terminal pads shall be located no less than 25" for 26,400 Volts and below and 30" for 34,500 Volts above terminal compartment floor or bottom of cable trench (where present).

b) Where service lateral cables are to be terminated six feet or more above the bottom of the cable trench or cubicle compartment floor, a structural member shall be provided, securely fastened to the terminal compartment walls complete with appropriate drilling to receive service lateral cable clamps. Cable clamp supporting member shall be located three feet minimum and four feet maximum below the center line of cable termination pads. Refer to 200.40.20 to determine required cable clamp drilling.

c) Station ground bus to be extended to the vicinity of cable termination. We Energies will furnish and install the materials necessary for bonding the service lateral concentric strands or lead sheath to the station ground bus.

d) Access to the service lateral termination compartment(s) shall be by hinged door(s) at the front or rear of the switchgear. We Energies will provide the necessary padlock(s).

e) Working space in front of cable termination shall be clear of all obstructions. This working space is for the installation and maintenance of the de–energized termination. Equipment mounted in front of the termination point shall be removable to permit proper installation of service lateral cables.

f) Service lateral conduit. Conduit shall enter switchgear from the bottom. *Top and side entrances are not permitted.*

g) Indoor Substation Application Only

g.1) Cable pulling anchors (see 200.40.30 and 200.40.40), installed at the locations specified by the Company.

g.2) Customer substations located below grade shall be provided with a 12–inch wide by 6–inch (minimum) deep cable trench in the floor as specified by the Company. Depth of

Part 2: Physical Requirements

trench required for specific installation shall be such as to meet the requirements of item (a) above. Only the Company's incoming line cables shall be allowed in this trench. Exposed portions of this trench shall be covered with removable "checker plate" consistent with conditions encountered. Size requirements for opening in basement or foundation walls are shown in 200.30.50.

g.3) Customer substations located at grade level shall be provided with service entrance conduit as specified by the Company.

g.4) When indoor customer substations are not located adjacent to an outside wall or not at or below ground level, the Customer shall furnish and install the required service lateral conduit encased in concrete as specified by the Company.

h) (Outdoor Substation Application Only) The Customer shall furnish and install, according to Company specifications, that portion of the service lateral conduit which is beneath the switchgear foundation or pad.

200.30.20) Cubicle-Type Substations Consisting of Metal-Clad or Metal-Enclosed Switchgear Supplied Via Three Conductor Lead Jacketed Cable.

The Customer shall furnish and install the following facilities for entry and termination of underground service lateral(s):

a) Pothead(s) for termination of service lateral cable(s) complete with aerial lugs and connections to cubicle bus. Pothead(s) shall be mounted in incoming line terminal compartment so as to provide a 32-inch minimum clearance between bottom of the pothead wiping bell and the bottom of the cable trench or cubicle compartment floor. Pothead(s) shall be as specified by We Energies.

b) Where the service lateral termination pothead(s) is/are to be mounted six feet or more above the cubicle compartment floor or bottom of cable trench, provisions shall be made for installation of cable support bracket(s). Such provisions shall consist of a structural member securely fastened to cubicle walls drilled to receive a cable support bracket. For three conductor lead covered cable, refer to drawing 200.40.10 for the required cable support drilling. These drillings shall be located at a point 3 feet minimum and 4 feet maximum below the pothead wiping bell. One cable support for each service lateral cable will be provided and installed by We Energies

c) Station ground bus to be extended in the vicinity of pothead mounting. We Energies will furnish and install materials necessary for bonding service lateral cable sheath to ground bus.

d) Access to the service lateral termination compartment(s) shall be by hinged door(s) at the front or rear of the switchgear. We Energies will provide the necessary padlock(s).

Part 2: Physical Requirements

e) Working space in front of pothead mounting shall be clear of all obstructions. This working space is for the installation and maintenance of the de-energized pothead termination. Equipment mounted in front of the pothead shall be removable to permit installation of the pothead.

f) Service lateral conduit. Conduit shall enter switchgear from the bottom. Top or side entrances are not permitted.

g) Indoor Substation Application Only

g.1) Cable pulling anchors (see 200.40.30 and 200.40.40), shall be installed at the locations specified by We Energies.

g.2) Customer substations below grade shall be provided with a 12-inch wide by 6-inch (minimum) deep cable trench in the floor as specified by We Energies. The trench depth required for the specific installation shall be such as to meet the requirements of item (a) above. Only the We Energies incoming line cables shall be allowed in this trench. Exposed portions of this trench shall be covered with removable "checker" plate consistent with conditions encountered. The floor trench shall extend from beneath the foundation or basement wall entrance to the pothead entrance. Floor trench serving one cubicle shall not be routed through another cubicle. Size requirements for openings in basement or foundation walls are shown in 200.30.50. The location of this opening shall be as specified by We Energies.

g.3) Customer substations at grade level shall be provided with conduit as specified by We Energies.

g.4) When indoor customer substations are not located adjacent to an outside wall or not at or below ground level, the Customer shall furnish and install the required service lateral conduit encased in concrete as specified by We Energies.

h) (Outdoor Substation Application Only) The Customer shall furnish and install, according to We Energies specifications, that portion of the service lateral conduit that is beneath the switchgear foundation or pad.

Part 2: Physical Requirements

200.30.30) Outdoor Substation Constructed on Open Framework and Supplied Via Lead-Jacketed or Direct Buried Service Lateral Cable.

The Customer shall furnish and install the following facilities for entry and termination of underground service lateral(s):

- a) A pothead support consisting of a structural framework complete with appropriate drilling capable of supporting the weight of the pothead and the service lateral cable. The pothead support shall be located at the height above final grade specified by We Energies. Potheads shall be as specified by We Energies based upon the size and type cable to be used.
- b) Working space in front of pothead mounting provisions shall be clear of all obstructions for a distance of four feet.
- c) Station ground bus shall be extended to the vicinity of pothead mounting. We Energies will furnish and install materials necessary for bonding of service lateral cable sheath to the ground bus.
- d) Structural framework complete with appropriate drilling to receive service lateral cable support bracket(s) at a point 4'6" below center line of pothead mounting provisions. Refer to drawings 200.40.10 and 200.40.20 to determine the required cable support drilling. One cable support for each service lateral cable will be provided and installed by We Energies.
- e) Connecting leads from pothead aerial lug terminals to substation bus.
- f) When slab-type structural foundations are to be used, the Customer shall furnish and install, as specified by We Energies, that portion of the service lateral conduit which is beneath the foundation.

200.30.40) Special Equipment or Construction

The Company shall be consulted to obtain specific requirements for equipment and construction which cannot be classified in any of the above categories.

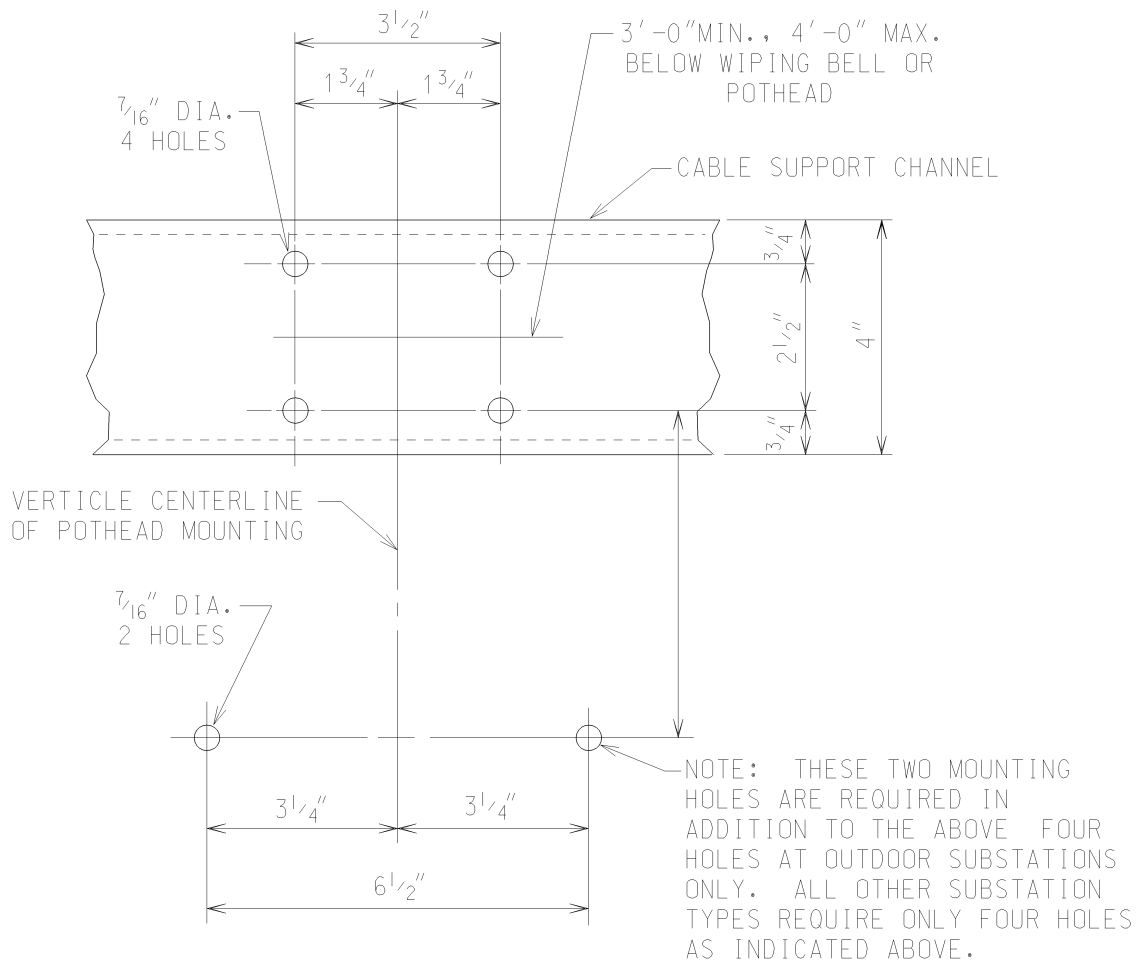
200.30.50) Size requirements for openings in basements or foundation walls.

Number of Ducts	Vertical Size of Wall Opening	Horizontal Size of Wall Opening
1	12"	12"
2	12"	18"
3	18"	18"

Part 2: Physical Requirements

200.40.10

Cable Support Drilling Detail for Lead Jacketed Cable

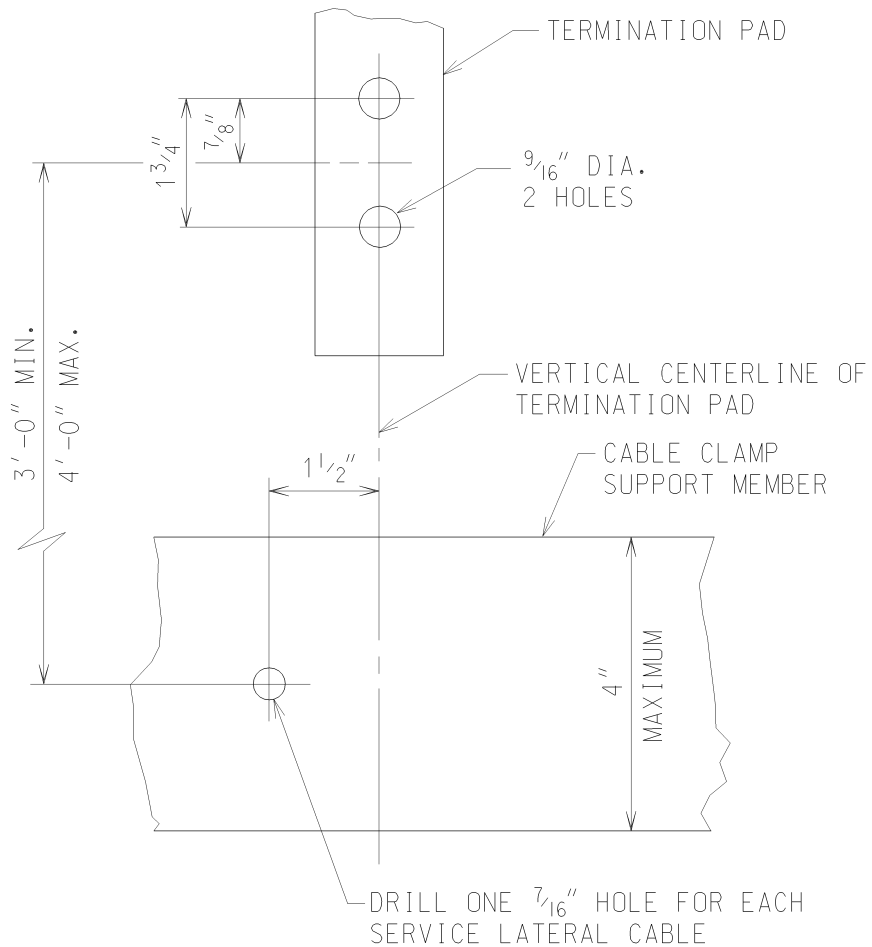


CGS File #91443F1

Part 2: Physical Requirements

200.40.20

Cable Support Drilling Detail for Direct Buried Cable

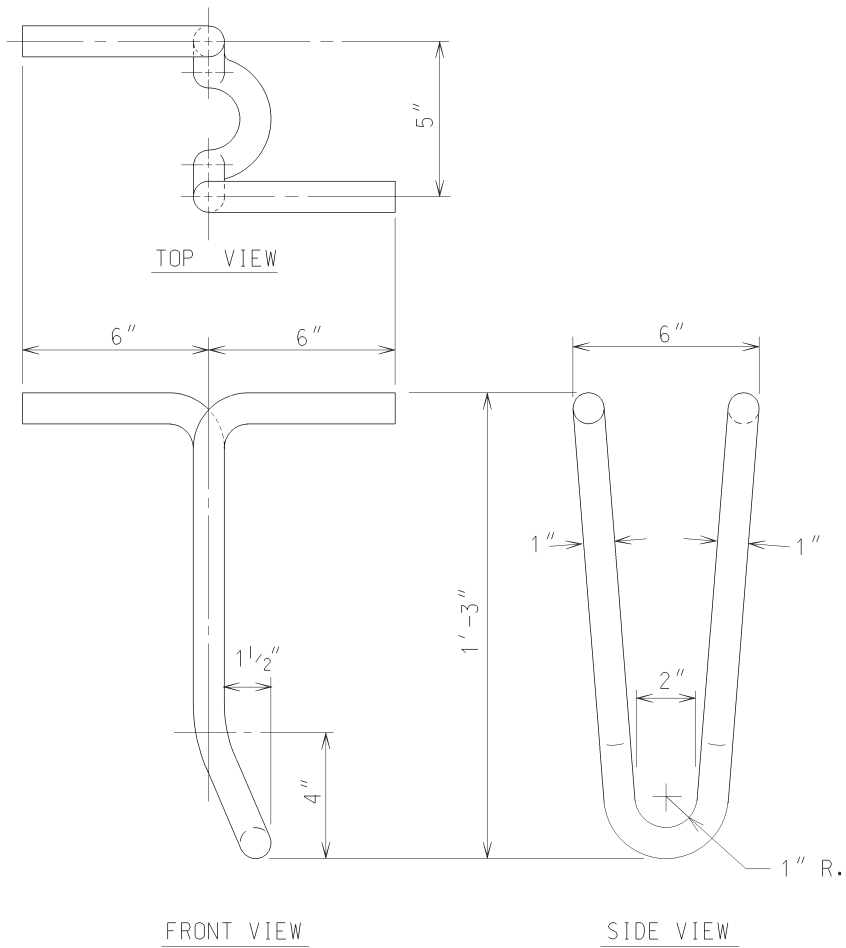


CGS File #91443F2

Part 2: Physical Requirements

200.40.30

Cable Pulling Anchor Detail



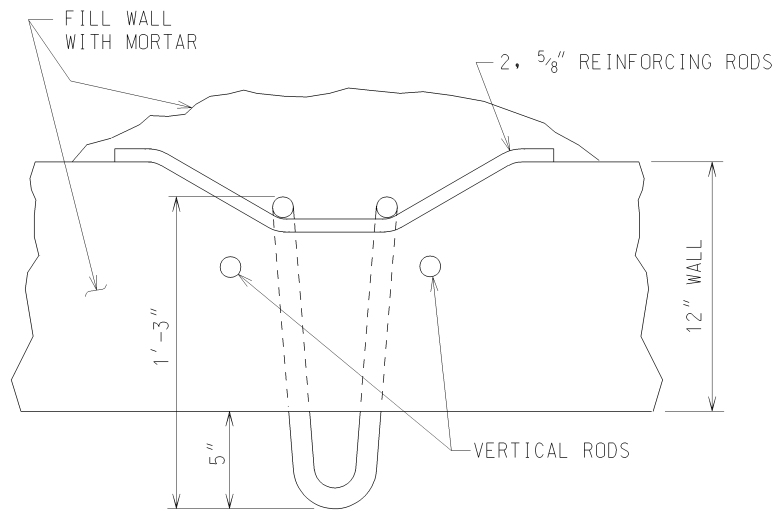
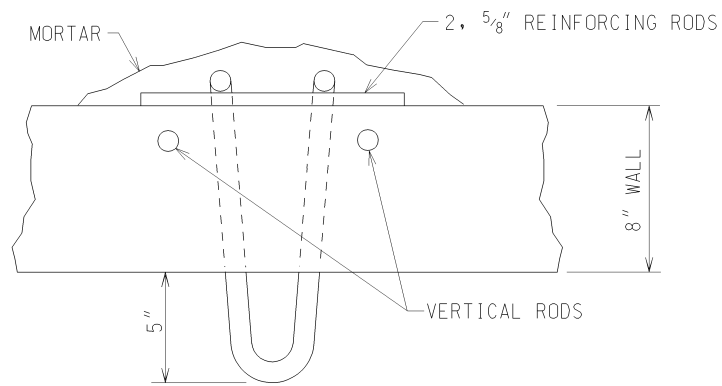
NOTE: MATERIAL, 1" ROUND STEEL, THOROUGHLY GALVANIZE AFTER BENDING. DEVELOPED LENGTH - 40 1/2".

CGS File #91443F3

Part 2: Physical Requirements

200.40.40

Installation of Cable Pulling Anchor



CGS File #91443F4